

Subject: INFORMATION: Interpretation of FAA requirements concerning special structural factors for transport airplane interior components

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From: Manager, Transport Airplane Directorate, ANM-100

Reply to  
Attn of:

To: All Directorates and Certification offices

There have been a number of questions concerning FAA requirements for special structural factors (see § 25.619) to be used for interior components such as seats, galleys, class dividers, closets, etc. This letter provides information in that regard.

The factor of safety required by § 25.303 applies in addition to any special factors except for load cases specified as ultimate (e.g., the emergency landing loads).

Casting factors required by § 25.621 must be applied to load carrying structural parts. Critical interior castings are those which would result in serious injury to occupants if they should fail. The failure of attachments for seats, seat belts, or heavy items of mass while under design load conditions are examples of failures which would cause serious injury. Castings used in those applications are considered critical, and §25.621(c) is applicable. Casting allowables under §25.621(d)(3) should be based on tests of full scale parts or from coupons cut from those parts. The casting allowables formerly listed in MIL-HBK-5 are not acceptable. During the production run, adequate sampling must be performed to assure consistency. For any given load condition, if any other special factor is equal to or larger than the casting factor, the casting factor need not be applied. The purpose of the casting factor is to reduce the likelihood of failure due to inclusions or porosity.

Bearing factors required by § 25.623 are applied to joints where free play exists and which are subject to vibration or pounding. A typical bearing factor used is 1.33. For any given load condition, if any other special factor is equal to or larger than the bearing factor, the bearing factor need not be applied. The purpose of the bearing factor is to reduce the likelihood of premature failure due to loads which are not easy to predict by analysis.

Fitting factors are required by § 25.625 for structural fittings which are not substantiated by limit and ultimate load testing. A 1.15 factor is normally applied for metallic fittings, but for seat or berth attachment fittings and seat belt attachment fittings, a 1.33 factor on the loads of § 25.561 must be used, whether or not the fitting is substantiated by testing (see § 25.785(f)). The 1.33 factor does not apply to flight loads, or ground loads other than the static emergency landing loads. Although not specifically required by regulation, a fitting factor of 1.33 is typically applied to the loads of § 25.561 for galley floor fittings. For any given load condition, if any other special factor is equal to or larger than the fitting factor, the fitting factor need not be applied. The purpose of the fitting factor is to reduce the likelihood of failure due to stress concentrations which may be difficult to predict by analysis.

In some cases, potted inserts or composite materials are used in interior parts. If failure of the parts would adversely affect safety, the suitability and durability of the materials used in the parts must be based on

experience or tests, and the effects of environment must be considered, as required by § 25.603. These considerations may take the form of additional special factors on loads.

If you have any questions concerning these criteria, the engineer on my staff most familiar with this subject is Mr. Bill Perrella, (206) 227-2116.

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